Sacroiliac Coalition: First Description and Report of a Successful Resection

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Abstract

Study Design Case report.

Objective This report describes the first case of a sacroiliac coalition, its clinical features, the diagnostic difficulties, and the surgical treatment chosen in this case.

Methods A 33-year-old man presented to our outpatient clinics complaining of severe left-sided low back pain with an intermitted nondermatomal radiation into the left thigh. The only abnormality on a pelvic radiograph was a coin-size, faint hyperdensity, which was almost overlooked. Subsequent computed tomography (CT) and magnetic resonance imaging (MRI) confirmed two bridging bone spurs on the anterior surface of the left joint with a fibrous interruption at the apex. After the conservative treatment failed, a surgical treatment was offered to the patient. The coalition was resected via an anterior retroperitoneal approach and through the tissue plane between the psoas and the iliacus muscles. A histopathologic examination was performed and confirmed the diagnosis of a coalition.

Results The patient's pain resolved immediately after surgery. After 8 months, a follow-up CT scan showed complete removal of the coalition without any signs of recurrence, and at 12 months' follow-up, the patient remained pain-free.

Conclusions This is the first published case of a sacroiliac coalition. The only sign of this rare condition on the plain radiographs was very easy to miss. As has been discussed in the literature, CT and MRI are important in the differential diagnostics of such lesions. The histopathologic findings included that of a fibrous bar, confirming the diagnosis, which is further corroborated by the complete resolution of the symptoms.

Keywords
- sacroiliac
- coalition
- first description
- resection
- low back pain
- referred pain

Introduction

True or primary coalitions are an aberrant union between two bones caused by a failure of segmentation of the primitive mesenchyme during development.[1] Acquired coalitions may arise in spastic flatfoots, inflammatory arthritis, intra-articular fractures, osteonecroses, and malignancies.[2–4] This malunion can be fibrous (syndesmosis), cartilaginous (synchondrosis), or bony (synostosis).[5] Coalitions are predominantly found in the rear foot joints between the talus and calcaneus, calcaneus and navicular, or talus and navicular bones or between the small carpal bones, causing pain or limitation of movement.[6] The treatment of coalitions includes temporary immobilization, injections with corticosteroids, or

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surgical resection.[5,7,8] A coalition between the sacral and the iliac bones has not been described before. Although this is the first description of a probably very rare condition, it underlines the importance of a systematic diagnostic process even in cases of apparently "typical" low back pain.

Case Report

A 33-year-old and otherwise healthy man spontaneously developed a severe left-sided low back pain. Initially, the pain was pronounced after sports activities or physically demanding work. With increasing intensity, the patient became unable to work in his job as a landscape gardener. Upon presentation to our clinics, he described a localized pain in the left sacroiliac region with an intermittent nondermatomal radiation into the left thigh. There was no history of trauma, previous surgery, inflammatory/rheumatoid conditions, or local injections for this pain. On clinical examination, the peripheral sensor and motor functions of the lower extremities were intact, and we found only a localized tenderness to pressure over the left sacroiliac joint.

A conventional radiograph (►**Fig. 1**) of the pelvis showed normal skeletal features, and the only abnormality was a faint hyperdensity in projection over the superior portion of the left sacroiliac joint. This lesion was almost missed on the first examination because of its smooth appearance and neighboring bowel gas. To further characterize this lesion, computed tomography (CT) (►**Figs. 2** and **3**) and magnetic resonance imaging (MRI; ►**Fig. 4**) were performed. Detailed evaluation of these imaging studies together with experienced skeletal radiologists rendered an inflammatory, a neoplastic, or a post-traumatic origin very unlikely. Morphologically, the lesion most closely resembled a coalition, which was not known to exist at the sacroiliac joint. To confirm this suspected coalition as the source of pain, a fluoroscopy- and contrast-guided injection with a local anesthetic (bupivacaine) was performed via a posterior approach that led to the almost complete resolution of the patient's symptoms for about 6 hours.

Because the conservative treatment with physiotherapy and a range of analgesics had failed, the patient was offered a surgical therapy. The resection of the coalition was performed via an anterior retroperitoneal approach and through the

Fig. 1 Pelvic radiograph of the 33-year-old man. Note the faint hyperdensity in projection over the superior portion of the left sacroiliac joint, which was nearly missed (arrow).

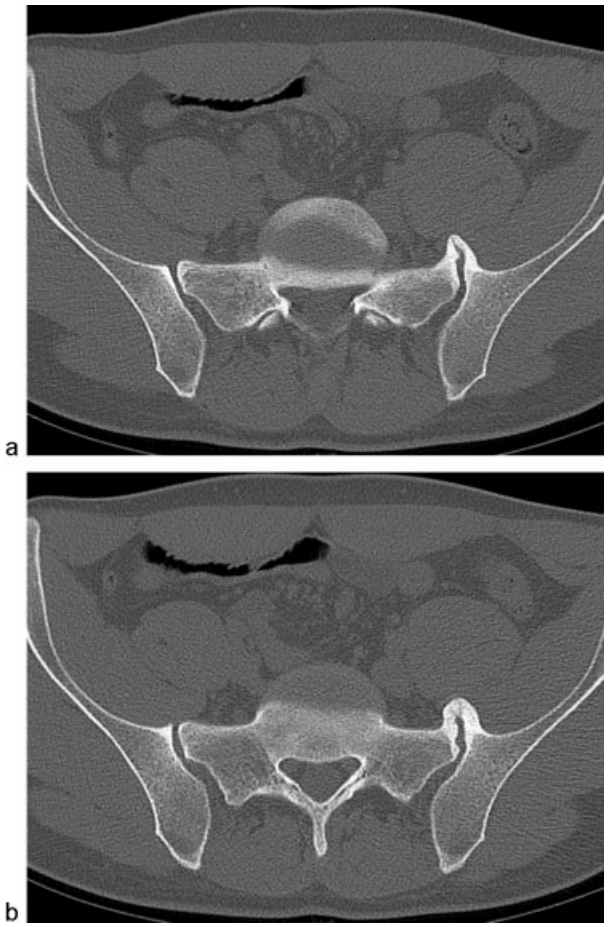

Fig. 2 (a, b) Axial computed tomography of the sacroiliac joints showing bridging bone spurs on the anterior surface of the left joint with a fibrous interruption at the apex. Otherwise, the pelvic structures are without signs of inflammation, osseous destructions, or sequelae of trauma.

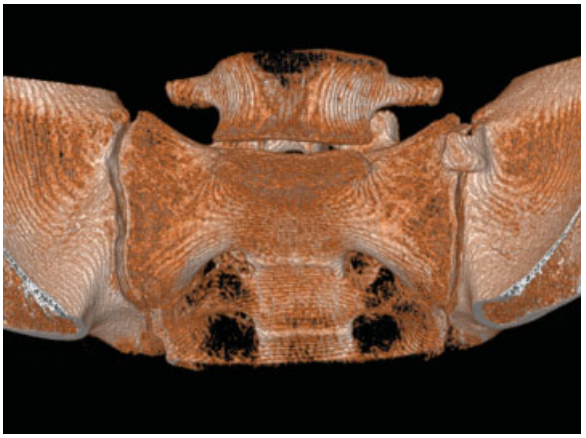

Fig. 3 Three-dimensional reconstruction from the computed tomography data depicting L5, the sacrum, and the adjacent iliac bone. This anterior view clearly shows the pointed and very localized bone spur bridging the left sacroiliac joint. The scan resolution is not quite high enough to clearly resolve this, but it can be appreciated that at the apex of the spur there is a noncalcified line running in a superior–inferior direction. This is also seen in the histologic sections.

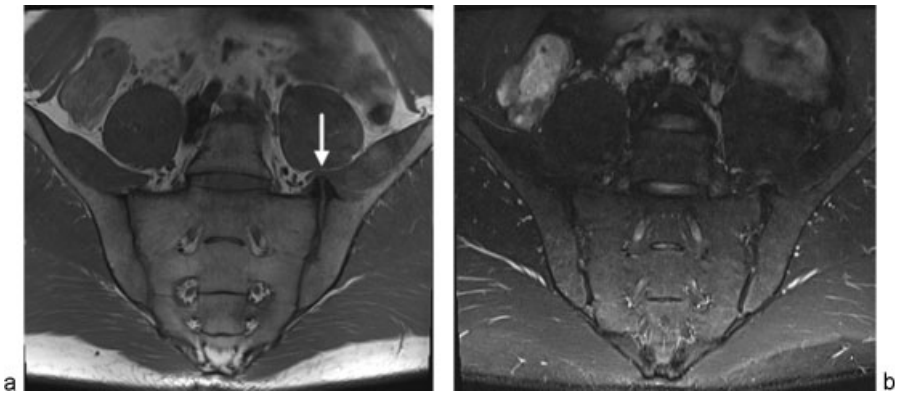

Fig. 4 (a, b) Paracoronal T1 and short tau inversion recovery magnetic resonance images of the sacroiliac joints. The bone marrow shows normal signal intensity without any bone marrow edema or fatty deposits. The joints appear normal without signs of inflammation, infection, or traumatic injury. Anteriorly, the bone spurs can be seen (arrow).

tissue plane between the psoas and the iliacus muscles. Technically, an osteotome was used to remove the bone spurs flush with the cortex of the surrounding bone, and the open pores of the resection footprint were sealed with a bone wax.

The patient's pain resolved after surgery, and the only complication was a postoperative hypoesthesia in the L4 dermatome that resolved within 6 months after the surgery. The histopathologic examination showed a predominantly laminar dense haversian-type bone with an inconspicuous osteoblastic lining and a minimal orthoclastic activity bridging a central, comparatively thin fibrocartilaginous component, similar to the "bar" known from coalitions of the foot (►**Figs. 5a** and **5b**). There was no infiltration by inflammatory cells and no cytologic atypia.

Follow-up visits were scheduled at 3, 6, 8, and 12 months. The patient remained completely pain-free and returned to work and sports activities without limitations. At 8 months, a follow-up CT scan showed the complete removal of the coalition without any signs of recurrence (►**Fig. 6**).

Discussion

The main differential diagnosis that we considered during the diagnostic workup was bridging osteophytes secondary to an injury or to an infectious/inflammatory process. As mentioned previously, the patient's history was completely devoid of any hints toward such a pathogenesis, even on targeted repeat questioning. The sacroiliac joints were completely normal on CT as well as on MRI, and the lesion was much more localized than degenerative changes usually are. In our case, the histopathologic examination also confirmed the diagnosis based on these imaging studies. A fibrous bar was suspected from the MRI, which is very typical for a coalition. We can only speculate that the slowly increasing calcification of this bar with age and its consequently increasing effect on sacroiliac joint kinematics caused the onset of the symptoms. The complete resolution of symptoms after resection and the absence of any local recurrence at 12 months further corroborate the diagnosis.

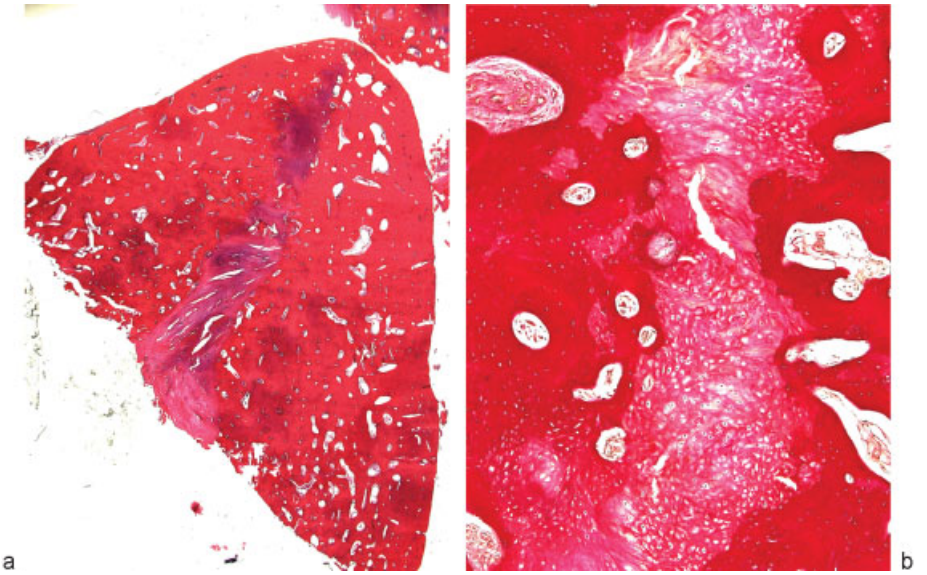

Fig. 5 (a, b) Histologic examination showed predominantly laminar dense haversian-type bone with a central fibrocartilaginous component. Overview: hematoxylin and eosin staining, ×10; magnified image: elastica van Gieson staining, ×100.

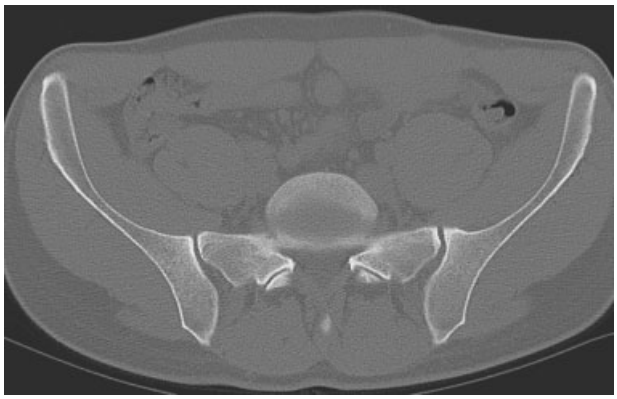

Fig. 6 Axial computed tomography image of the pelvis 8 months after surgery. The slice location is identical to image in ►**Fig. 2a**. It shows complete removal of the coalition without any signs of recurrence.

Disclosures
Axel Greiner, none
Andrea Baur-Melnyk, none
Sabina Berezowska, none
Melvin D'Anstasi, none
Christof Birkenmaier, none

Conflict of Interest Statement
Each author certifies that he or she has no conflict of interest in connection with the submitted article.

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